

REMARKS

Claims 1-17, as amended, are pending herein. Claim 18 was previously cancelled.

Figure 3 has been revised in accordance with 37 CFR 1.83(a) which states that in cases where conventional features are disclosed in the claims and where their detailed illustration is not essential for understanding the invention, a labeled rectangular box can be used to illustrate those features. Fig. 3 has been amended to now show the explosive charge and the firing pin in phantom labeled rectangular boxes. In this connection, the present invention relates to an improvement over the projectile shown in the applicant's previous application WO 99/51934, as is discussed in the description. The improvement concerns the shielding means, with the explosive charge and the firing pin being conventional features of this type of projectile such as is described in WO 99/51934.

Claims 6 and 16 have been amended to overcome the rejections thereof under § 112, second paragraph.

Claim 1 has been amended to clarify that the shielding means is separately slidable, i.e. independent, from the initiator, albeit that it slides in response to the movement of the initiator. Basis for this amendment is clearly implicit from the description; see, for example, page 14, line 31 to page 15, line 1 and Figures 3 and 4, where shutter 106 is shown and described as a separately moveable (slidable) part.

In this regard, the claimed invention concerns a small arms projectile for use in a small arms weapon, such as a shotgun. Such projectiles are fired from the weapon barrel using a propellant charge and contain an explosive charge inside their warhead designed to detonate on impact with a target. As will be appreciated, due to the nature of such projectiles, there are a number of technical considerations that are specific to this field. For instance, a number of

mechanisms are required to ensure that the explosive charge inside the projectile does not detonate prematurely, for example when the propellant charge is detonated or if the projectile is dropped. The claimed invention concerns such mechanisms.

In this connection, the claimed invention concerns a shielding means which is provided between the initiator and the explosive charge, and which is slidable separately from the initiator. When in the safety position, the shielding means shields the explosive charge from the initiator, such that detonation of the initiator will not detonate the main explosive charge. When the initiator moves from its safe condition to its armed condition, where it can be impacted by the firing pin, the shielding means in response slides to its armed position where detonation of the initiator can cause detonation of the main explosive charge. In this way, the present invention provides a double level safety mechanism. That is, the explosive charge cannot be detonated until both the initiator and the shielding means have moved into their armed positions. The present invention therefore provides a much safer small arms projectile, since even if the first level of protection of providing the initiator in its safe condition fails and the initiator were to accidentally or prematurely detonate, the shielding means is still able to prevent the detonation of the main explosive charge.

1. Claims 1-8, 10 and 13 were rejected under § 102(b) as anticipated by the Lohman US patent No. 3,313,236.

In contrast to the present invention, Lohman relates to a timed fuse for use in bombs to be deployed by aircraft. In particular, Lohman concerns the problem of preventing detonation of a bomb if it is dropped at too low an altitude where detonation would otherwise cause damage to the aircraft (see col. 1, lines 16-44). To achieve this, Lohman discloses a timing system whereby a sequential delay primer A is used to time the release of carrier member 18. That is, when the

sequential delay primer A is ignited by firing pin F, it slowly burns through until it ignites a shearing charge in order to rupture the casing of primer A and release carrier member 18 (see col. 4, lines 57-75).

As mentioned above, the claims of the present invention all recite a small arms projectile for a small arms weapon. In contrast, Lohman only concerns the field of air-deployed bombs and discusses no other applications for such as device. Indeed, the recited objects of that invention at col. 3, lines 3-6 make it clear that Lohman is only directed to air-deployed munitions. Lohman does not disclose or in anyway suggest a small arms projectile. Furthermore, it should be appreciated that Lohman concerns a totally distinct technical field, having very different technical considerations. For example, the function, size and complexity of the timing device employed by Lohman would make it totally unsuitable for use in a small arms projectile, and therefore this disclosure would not even be considered by a person skilled in the art.

Moreover, as mentioned above, in the claimed invention the shielding means slides to the armed position in response to the initiator moving from the safe to the armed condition. In contrast, with Lohman, carrier member 18 moves to the armed condition in response to the shearing charge rupturing sequential delay primer A. That is, with Lohman, the impact detonator B moves into the armed position as soon as the lanyard or safety pin is pulled free, as shown in Figure 2, with the carrier member 18 moving into position once a predetermined time has expired, as determined by the sequential delay primer A. Therefore, the carrier member 18 does not move in response to impact detonator B, as in the present invention.

The above is an important distinction since, as well as providing two levels of safety, the mechanism of the present invention also achieves reliable detonation of the main explosive charge by moving the initiator and the shielding means to the armed position simultaneously. In

contrast, Lohman is specifically designed to allow the detonation of the impact detonator B by the firing pin F even when carrier member 18 is not in position (see col. 4, lines 50-56).

Therefore, carrier member 18 operates irrespective of the position of impact detonator B, and hence the firing mechanism of Lohman is less reliable than that of the present invention.

It is therefore submitted that claim 1, and all claims dependent thereon, are novel and inventive over Lohman.

2. Claim 17 was rejected under § 103(a) as obvious over Lohman in view of the Blain US patent No. 5,969,287. However, Blain fails to make up the above deficiencies in teaching. As with Lohman, Blain is not relevant to small arms projectiles for a small arms weapon, as recited in the claims. Instead Blain relates to separating sections of a rocket. Furthermore, it is also submitted that a person skilled in the art would not consider the technical fields of fuses for aircraft deployed bombs (Lohman) or of section separation in rockets (Blain) when considering the present invention which relates to small arms projectiles.

3. In paragraph 7 of the Office Action, the Examiner contends that the claims 1-8, 10, 11, 13 and 14 are anticipated by the Jasse US patent No. 2,938,463.

As with Lohman, Jasse concerns a timed fuse for use in bombs or rockets to be deployed by aircraft. In particular, Jasse provides a timer to prevent a projectile from exploding until it is sufficiently far away from the firing device and to automatically detonate the projectile if it has not hit its target within a predetermined time (see col. 5, lines 25 - 29 and 36 - 45). As the timing mechanism, Jasse uses a “dash-pot” P<sup>1</sup> containing a viscous liquid such as silicone which controls the speed at which a piston can move through the dash-pot (col. 3, lines 29-43 and col. 5, lines 6-10).

Accordingly, in contrast to the present invention, Jasse only concerns the field of air-deployed rockets and discusses no other applications. Jasse does not disclose or in any way suggest use in a small arms projectile, as recited in claim 1. Further, as with Lohman, the function of the mechanism of Jasse, as well as its size and complexity make it totally unsuitable for use in a small arms projectile. This emphasizes that Jasse relates to a totally distinct technical field with very different technical considerations. As such, this disclosure would not even be considered by a person skilled in the art of small arms projectiles.

Furthermore, Jasse even specifically mentions the invention is intended to be launched from a flying machine without gun effect, that is "under its own means of propulsion, the later being insured solely by the thrust of the gasses of the propelling charge housed in the rocket" (col, 2, lines 17-21). This is because the mechanism of Jasse and the liquid nature of the timing mechanism make it suitable only for large rocket type projectiles, which have a relatively long flight time and are self-propelled, and hence do not have such rapid acceleration as is associated with explosive gun type projectiles. Therefore, the teaching of Jasse simply could not and would not be applied to the field of small arms projectiles, which are considerably smaller, accelerate quicker and generally have much shorter flight times.

Moreover, even ignoring that Jasse does not relate to a small arms projectile, there are further differences from the claimed invention. For example, Jasse functions by releasing carrier part 15 and part P<sup>2</sup> allowing them to move forwardly under action of a spring and under the speed control of the liquid in dash-pot cylinder P<sup>1</sup>. After a predetermined time, this releases slide 59 which moves the detonator 62 into position above the explosive charges D and E (Col. 5, lines 20-35). Separate from this, part P<sup>2</sup> contains a striker pin 49 which is connected to a frangible ring 52 and frangible plate 40. When these frangible components shear, for example, in the event of

an impact, this releases striker pin 49 allowing it to strike the primer 23 held by carrier part 15 (see col. 5, lines 46-58). Accordingly, if the shearing of these frangible components occurs after the detonator 62 has moved into position, then the detonator will be fired by the primer 23 and the explosive charges D and E will in turn be detonated. Conversely, if the detonator 62 has not moved into position, shearing of the frangible components will only cause the detonation of primer 23, and not the detonator 62 or explosive charges D and E because the detonator is offset and the fire transmission chain is interrupted (col. 4, lines 41-46).

At section 7 of the Office Action, the Examiner contends that primer 23 and slide 59 of Jasse correspond, respectively, to the initiator and shielding means of the claimed invention. Claim 1 of the present application states that the initiator has a safe condition and an armed condition where it can be impacted by the firing pin. However, as discussed above, in Jasse the primer 23 can be impacted by the striker pin 49 at any time, provided the frangible components 52 and 40 have sheared. The primer 23 of Jesse therefore does not have a safe condition, as in the claimed invention, since it is always capable of being struck by the striker pin 49.

Therefore, Jasse does not provide the double level safety mechanism of the claimed invention since the only barrier to the detonation of the main explosive charge is the lateral offset of slide 59/detonator 62 (col. 4, lines 41-46). The action of the primer 23 moving forwardly shown in Figures 1 and 4 of Jasse is merely as a consequence of carrier part 15 moving to release the slide 59 and not to arm the primer 23. Hence, the slide 59 does not move in response to the primer 23 moving to an armed condition since the primer 23 is already "armed". This is exemplified by the fact that the striker pin 49 and primer 23 are aligned and adjacent one another in Figure 1, demonstrating that the primer could be detonated.

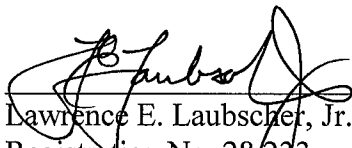
It is therefore submitted that claim 1, and all claims dependent thereon, are novel and inventive over Jasse.

Finally, it is noted that the Shekro US patent No. 3,620,163 also relates to a bomb and is not relevant to small arms projectiles (paragraph 10 of the Office Action). The aforementioned comments regarding the different technical fields apply to this disclosure too.

Allowance of claims 1-17 is courteously solicited.

Respectfully submitted,

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I hereby certify that the foregoing AMENDMENT is being submitted via the U.S. Patent and Trademark Office Electronic Filing System on **June 20, 2007**.

Shelly Hubbard

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